

A1
Preferably, the bypass valve 82 is normally open such that the piston 78 is normally deactivated.
The solenoid 84 is preferably activated by a signal from an engine electronic control unit 90.--

IN THE CLAIMS:

10-13 *21-30*
Please cancel non-elected claims 10-13 and 21-30 without prejudice or disclaimer.

Please amend claims 1, 5, 14, 16, 31 and 38 as follows:

Sub 10-13
A2
1. (Amended) A high pressure piston pump, comprising:
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
at least two pistons disposed in the housing;
a driveshaft for supplying power to drive the at least two pistons; and
a bypass valve fluidly connected to at least one of the at least two pistons to deactivate
the at least one piston, wherein the piston to which the bypass valve is connected to has a surface
area that is different than a surface area of the other piston of the at least two pistons.

Sub 10-13
A3
5. (Amended) A high pressure piston pump, comprising:
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
at least two pistons disposed in the housing;
a driveshaft that drives the at least two pistons; and
a bypass valve fluidly connected to at least one of the at least two pistons to deactivate
the at least one piston, wherein the piston to which the bypass valve is connected to has a surface
area that is larger than a surface area of the other piston of the at least two pistons.

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A4
14. (Amended) A high pressure radial type piston pump, comprising:
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
three pistons disposed in the housing;

OK 102
a driveshaft for supplying power to drive the three pistons; and
a bypass valve fluidly connected to one of the three pistons to deactivate the one piston,
wherein the piston to which the bypass valve is connected to has a surface area that is different
than a surface area of each of the other pistons.

sub c'
16. (Amended) A high pressure radial type piston pump, comprising:

OK 103
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
three pistons disposed in the housing;
a driveshaft that drives the three pistons; and
a bypass valve fluidly connected to one of the three pistons to deactivate the one piston,
wherein the bypass valve is normally open such that the one piston is normally deactivated.

31. (Amended) A method of varying the flow output of a high pressure piston pump having at
least two pistons comprising:

OK 102
pumping fluid by a first piston of the at least two pistons, the first piston having a first
surface area;
pumping fluid by a second piston of the at least two pistons, the second piston having a
second surface area different from the first surface area; and
deactivating at least one of the at least two pistons.

OK 102
38. (Amended) A high pressure fuel injection system, comprising:

OK 102
a source of fuel;
a low pressure pump;
a high pressure piston pump, the low pressure pump being disposed between the fuel
source and the high pressure piston pump;
a fuel rail including a plurality of fuel injectors, the high pressure piston pump being
disposed between the low pressure pump and the fuel rail; and
a fuel return line connecting the fuel rail to a low pressure side of the high pressure pump;

Sub B
wherein the high pressure piston pump comprises a housing having a low pressure fuel inlet connected to an output of the low pressure pump, a high pressure fuel outlet connected to an input of the fuel rail, at least two pistons disposed in the housing, and a bypass valve fluidly connected to at least one of the at least two pistons to deactivate the at least one piston and wherein the at least one piston to which the bypass valve is connected to has a surface area that is different than a surface area of the other piston of the at least two pistons.

Please add the following new claims:

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103
43. (New) The high pressure fuel injection system according to claim 38, wherein the bypass valve includes a normally open valve.

44. (New) The high pressure fuel injection system according to claim 43, wherein the bypass valve includes a solenoid adapted to open and close the bypass valve.

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Be
78
A/B
103
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add + 100
45. (New) A high pressure fuel injection system, comprising:
a source of fuel;
a low pressure pump;
a high pressure piston pump, the low pressure pump being disposed between the fuel source and the high pressure piston pump;
a fuel rail including a plurality of fuel injectors, the high pressure piston pump being disposed between the low pressure pump and the fuel rail; and
a fuel return line connecting the fuel rail to a low pressure side of the high pressure pump;
wherein the high pressure piston pump comprises a housing having a low pressure fuel inlet connected to an output of the low pressure pump, a high pressure fuel outlet connected to an input of the fuel rail, at least two pistons disposed in the housing, and a normally open bypass valve fluidly connected to at least one of the at least two pistons to deactivate the at least one piston.

Subcl

46. (New) The high pressure piston pump of claim 5, wherein the bypass valve includes a solenoid for opening and closing the bypass valve.

47. (New) The high pressure piston pump of claim 46, wherein the bypass valve is normally open such that the at least one piston is normally deactivated.

48. (New) The high pressure piston pump of claim 46 comprising three pistons wherein the bypass valve is fluidly connected to only one of the three pistons.

Sub claim 103
49. (New) The high pressure radial type piston pump of claim 16, wherein the bypass valve includes a solenoid for opening and closing the bypass valve.

Sub claim 103
50. (New) The high pressure radial type piston pump of claim 16, wherein the one piston to which the bypass valve is connected has a surface area that is larger than a surface area of each of the other two pistons.

Sub claim 103
51. (New) The high pressure radial type piston pump of claim 50, wherein a surface area of the one piston to which the bypass valve is connected to is approximately twice the surface area of each of the other two pistons.

Sub claim 103
52. (New) The high pressure radial type piston pump of claim 49, wherein the solenoid is activated by a signal from an engine electronic control unit.

Sub claim 103
53. (New) The high pressure radial type piston pump of claim 16, wherein the driveshaft includes a cam portion that drives the three pistons.